

A
L E T T E R
TO THE
P U B L I C K,
CONCERNING
B O O G S.

Exiguum Colito.



D U B L I N :

Printed for G. and A. EWING, MDCCLVII.

A

LETTER

TO THE

PUBLIC

OF THE



PRINTED BY
J. G. AND A. E. M. M. M. M.

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L E T T E R

T O T H E

P U B L I C K, &c.

THE small Advances that have been made in draining the Bogs of this Kingdom, and the little Benefit that has accrued from the present Method of trenching small Portions of them, makes it to be wished a Method could be found out to drain effectually, and in one Season, a Bog of the greatest Extent, at such a moderate Expence, that the Publick may reap a real Benefit from it ; but as no Method yet offered has been thought sufficient to answer that End, one may be apt to conclude, such an Attempt is generally believed to be impracticable ; but before it be quite despaired of, let it be considered, that *England*, and most other States,

were formerly as remarkable for Bogs as *Ireland* is now; and if the People of this Country would vigorously attempt the reclaiming theirs, they have probably as good a Prospect of succeeding in it as others have had; and when the Cause of Bogs is thoroughly understood, it may not be so difficult to apply a Remedy as is generally imagined.— I shall venture to offer my Opinion in this Matter, and how imperfect soever the Scheme may be, I flatter myself there are some Hints in it, which may serve at least as a Foundation for such farther Inquiry, as may lead to the Discovery of a Method that may effectually answer the Purpose intended.

As to the Origin and Formation of Bogs, the general Opinion that they do increase is well grounded, but in what particular Manner they have acquired their present Depth, has not been yet treated of in so satisfactory a Manner as might be wished.

It is observable, that all low Lands are not only subject to Moisture by retaining the Rains that fall on them, but are often liable to be overflowed by receiving the Springs that flow, as well as the Floods that precipitate into them, from the adjacent Hills or rising Grounds.

Where there is a constant Flow of Water into a Valley by means of Springs, and the Soil
thereof

thereof will not admit a sufficient subterraneous Discharge, those Waters will form a Stream in those Parts of the Valley that lie lowest, and discharge themselves into some contiguous River, but when the Channel of such Stream is by some Accident choaked up, so that the Waters cannot have a free Passage as usual, but are impeded by the falling in of a Bank, Trees, or some such adventitious Matter, and dam'd up on a Level with the impeding Matter, they will necessarily overflow the adjacent Parts and rise till they find a Vent.

When the Quantity of such impeding Matter is so great as to retain and bank in the Waters of the Valley, and make them swell and rise to a very considerable Height, the Valley thereby suddenly becomes a Lough; when the Dam or Stoppage causes the Waters to rise and overflow the Land only a few Inches, as much of the Valley as is so covered with Water, causes the Soil thereof to become marshy, and where such Stoppage increases by the Access of new Matter to it, the marshy Soil gradually rises and becomes a Bog; and it is easy to conceive that the Dam not only may, but necessarily must receive an Addition to it from Time to Time, by the thorn Herbage or floating Sedge that is stopp'd by it in it's Passage; for when the firm Soil of a Valley is changed into a Marsh, from that Time

it becomes the Haunt of wild Fowl, who resort to it in great Flocks, and in searching for their Food, nip off the Moss and other Herbage growing thereon; great Part of which being set afloat, and carried at the Time of Floods where the superfluous Waters discharge themselves, is stopp'd at the Dam, and settling there, in Time becomes a Congeries of matted sedgy Substance, produces aquatick Weeds, as Flaggers, Rushes, &c. and the next Flood carrying thither more Sedge occasions the Stoppage to increase gradually in Proportion to the Quantity of Sedge impeded by those Weeds, and supposing the sedgy Matter increases the Stoppage of the natural Vent $\frac{1}{2}$ of an Inch every Year, in the Space of 500 Years it would cause the Turf of the Bog to increase in Height about 20 $\frac{1}{2}$ Feet. The slow Increase of the Dam by Means of the Stoppage of the Sedge gives Time for the gradual Formation of Turf. The Herbage growing on Marshes is very strong and rank, the Sward whereof withers in Winter, but retains its Form and Substance while supplied with Moisture, and that Part which is nipt off or shorn, and exposed to alternate Droughts and Moisture, rots and putrifies, which, together with the Dung of the wild Fowl, becomes a slimy muddy Substance, fit for Vegetation, whence annually arises an Increase of Herbage and other Matter whereof Turf is composed, rising

sing and keeping Pace with the Increase of Matter at the Dam.

So much of the shorn Herbage as is carried by the Draught of the Stream towards the Dam at the Time of Floods, and stop'd there, forms a quaking Bog, for not having any Thing for its Foundation but pure Water, it causes that undulating Motion observed in walking on it, and differs from a turfy Bog in that it does not by a Plexus of it's Roots spring from, or adhere to the earthy Soil at the Bottom, but being agitated on the Waters by the Winds, becomes a floating matted tough Substance composed of branched Moss, the Filaments of Bogberries, and other Herbage that is not liable to putrify, by being always supplied with Moisture sufficient to preserve it from the Effects of a drying Air or too much Heat.

It will be proper to give some Account of the Cause of those Pools of pure Water found interspersed in several Parts of most Bogs, as well as those large Channels of Water seeming like Rivulets running through them: the former were originally Hollows in the Valley, fill'd by the sudden rising and flowing of the Waters into them, as the latter were the natural Channels for the Discharge of the Waters of the Valley before it became a Bog, which by the

Sudden Stoppage at the Dam, swell'd the Waters of the Valley to such a Heighth, that the Seeds of the Herbage could not spring up from the Bottom thereof, as they did from those Parts of it, that were shallower, less overflowed, and in Summer Time perhaps, had no settling of Water upon them at all. The Existence of these Pools is a strong Reason that Bogs could not originally have been as they now are, because admitting they were, it would be difficult to account for the Growth of Turf in one Part of them and not in another; besides, if the Waters of Bogs always have been at their present Depth, instead of forming Bogs, they would necessarily have formed Loughs without any Turf at all in them, for the Matter or Turf of Bogs, being from ten, to perhaps twenty Feet deep in many Parts, and composed of such Herbage as could not originally have vegetated that Depth under Water, it is evident no such Substance as Turf could have been formed, but by the gradual choaking up of the natural Vent, and the Increase of the turfy Matter in Proportion thereto: Unless Bogs have increased by some such adventitious Matter, as I have mentioned, it would be very difficult to account for those large Trees that are found in digging Turf; for if it were to be supposed they might possibly be blown down by Storms from high Hills into the Bog, they would always be found near the Edge thereof, as their Weight would immediately sink them in it,

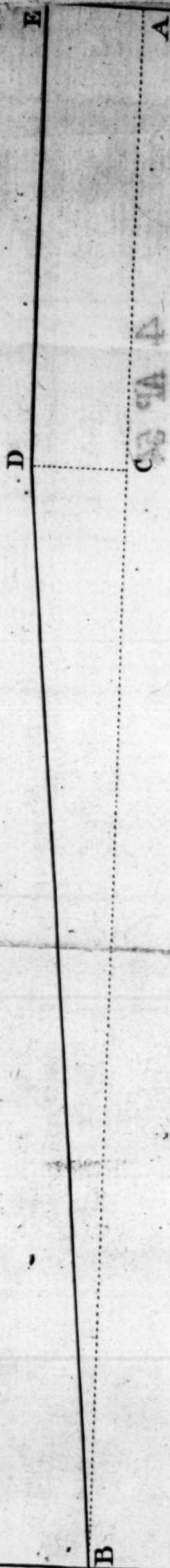
it, and prevent them from being moved farther, whereas they are more frequently found very far in Bogs, consequently they must have grown in the Place where they are found; and that part of the Bog must have been once firm Land, because large Trees could not have supported themselves against Storms in a quaggy or boggy Soil of so great Depth as 10 or 20 Feet.—Allowing that the Soil which Bogs now overspread was once firm Land, not liable to Overflowings as it now is, but became accidentally so, and that Bogs were originally formed by the gradual choaking up of the natural Vent of the Waters of the Vallies, the most probable Method of draining them, must be to find out and open the Obstruction, and give the pent up Waters a free Passage into some Rivulet or Channel leading to some River.

That all Bogs have a Communication with some River, or Rivulet, is more than probable; because as I have already observ'd, before the Vallies became Bogs, they must have had a superficial Discharge of the Waters that flowed into them, otherwise they must have become Loughs instead of Bogs, and that all Bogs even at this Day, must have a superficial Discharge of their Waters when they rise above the Surface of the Turf, is evident from the following Consideration :

sideration: Suppose the Bog Water by a Continuance of wet Weather to have risen just up to the Surface of the Turf, and while it remained at this Height, such a sudden and excessive fall of Rain should happen as would occasion a great Flood in Rivers, how much higher than the Surface of the Turf would the Waters of the Bog at such a Time rise, if there was no superficial Discharge at all? The Depth of Rain that would on such an Occasion fall immediately on the Face of the Bog, might probably not exceed $2\frac{1}{2}$ Inches above the Surface of the Turf; and the Increase of Water by Means of the Springs and Torrents of Water from the Uplands, might very reasonably be computed at about 5 Times more than what would fall perpendicularly on it; the superfluent Waters in such Case would rise 15 Inches above the Surface of the Turf; but that it never does rise to any such Height is evident by the Roads made through Bogs, which though sometimes overflowed, yet the Depth of Water on them seldom exceeds 4 Inches, consequently there must be a superficial Discharge, otherwise the Water would at such Times rise to the full Height of 15 Inches above the Surface of the Turf: The Overflowing of a Bog therefore is in Proportion as the Influx from the Uplands and Springs exceeds the Efflux, where the Outlet for the superficial Discharge is so narrow, as not to be capable of receiving and emitting the

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the whole. Admitting that the superfluous Waters do discharge themselves through some Outlet and find a Passage from the Bog to some River it necessarily follows, that from the Turf of the Bog, to where the Rivulet or Channel of a Rivulet shews itself, there must be a Descent or Fall, and that this, and no other, is the proper Place to open the main Drain for receiving and discharging the Waters of a Bog.

Where such a Fall may probably be found, is explained by the Fig. shewing the Situation of the Bog, and the Descent from it; from *A.* to *B.* the Rivulet or Channel through which the Springs of the Valley discharged their Water before it became a Bog, *C.* the Stoppage or Dam by the accidental falling in of the Bank, which rose gradually to it's present Height at *D.* being I'll suppose 10 Feet. From *E.* to *D.* the superficies or Level of the Turf of the Bog as it now is, and from *D.* to *B.* a supposed gradual Fall, where the Waters of the Bog discharge themselves into the Rivulet at the Time of Floods. Now, by the Sedge stopping at, and increasing the Height of the Dam 10 Feet, it must cause either a perpendicular Fall of that Depth at *D.* or a gradual Declination on the lower Side of the Dam towards *B.* but as no such perpendicular Fall is to be found contiguous to any Bog, one must conclude there is thence a gradual Descent, and yet

yet it is difficult at first to conceive how so great a Quantity of Sedge should flow over the Dam, settle and be collected so as to join and be almost on a Level with what is collected on the other Side; for on a Supposition that all the floating Sedge is not stop'd at the Dam, but in Time of Floods the greatest Part is carried over it, what can prevent it from being carried quite away with the Flood, and consequently leave a perpendicular Fall there? It may be thus accounted for; the Dam or Stoppage not being perhaps above 6 or 8 Inches high at first, it may reasonably be allowed that aquatick Weeds might spring as well from the Mud on the lower Side; as from the sedgy Matter stopp'd on the upper Side of the Dam, and though the Situation of the one was so much higher than the other, yet as Part of the floating Sedge (which in time of Floods escaped the Weeds on the upper Side) would necessarily be entangled and stopp'd by the Weeds adjoining the lower side, it would not fail, in Time, of joining the Sedge on the upper Side; and as the sedgy Matter gradually lessened in Quantity the farther it proceeded in it's Course down the Stream by the several Impediments it met with, it must in Consequence thereof naturally have caused a Descent, which must have continued without any intervening Level, till it ended and lost itself in the Channel leading to the River, where it would afford a Fall equal to the Height
of

of the Dam; how far such a Descent may extend itself cannot be easily determined, but one may reasonably suppose the Descent may be from one Quarter to half a Mile; thus by gradually extending itself so far, it becomes invisible to the naked Eye, and this might have been hitherto one very great Discouragement to the undertaking the draining of Bogs, for it was natural to conclude one could not expect to find a Fall where no such was visible, and indeed it must be confessed, that of all Descents, those from Bogs are the most difficult to be discovered by the Eye, for being over-grown with aquatick Weeds of different Heights, they confound and perplex the Sight so, that one cannot fix it on any Surface to form the Judgment by; besides the Course of Rivulets being usually Serpentine, the Sight is broken at every Return.

The most probable Method that has occurred to me, in order to find out where a Fall is, is to take Notice where a Rivulet, or Channel of a Rivulet shows itself adjoining the Bog which you will find to be in an Opening or Outlet between two Hills or rising Grounds: if you find no Water in it in Summer Time, inform yourself whether in Time of Floods there is a great Flow of Water there, if you find there is, you may assuredly depend on it, it is caused by a superficial Discharge, and Flow of the Bog Water into it, and that must be the proper

proper Place to look for and expect a Fall : Begin about a Mile from the Turf of the Bog ; to trace the Channel of this Rivulet upwards, and when you come to such aquatick Weeds as usually grow on the sedgey Parts of Bogs (which you will find in many Respects different from what grow in the Channels of Rivulets or on the turfy Parts of Bogs) conclude you are come to the Foot of the Descent, and that from thence there is an Ascent to the Level of the Bog, wherever there is an Appearance of great Quantities of matted Sedge, called also old Wives Tow, you may be certain a great Length and Depth of it could not have been aggregated there, unless it were brought thither by the Draught of the Stream, to the Outlet where the superfluous Waters discharge themselves ; there is another Indication whereby you may probably discover where the Descent or Fall is, for there the Surface will be moist even in the hottest Weather, as high as the Level of the Bog Water is, by the continual oozing of the Bog Water through the Sedge ; you will also observe greater Plenty of Moss than on the Superficies of the Turf of the Bog ; here begin to take your Level.

These Indications will probably lead you to a Fall in either a wet or dry Bog. But in a wet Bog, I am of Opinion, there is a more certain and shorter Method to direct to the Fall
than

than either of these. I have taken Notice that in a wet Bog, there is generally, if not always a visible Channel of Water stretching a great Length, and was the original Channel for the Discharge of Waters of the Valley before it became a Bog, which disappearing, I will suppose at *E*, is filled up or skinned over with the floating Sedge forming a quaking Bog, as far as the Dam at *D*. in this Case it would be advisable (instead of beginning from below *B*, to trace the Fall upwards) to begin taking your Level from *E*, and so proceed downwards; for by this Means you will be sure of immediately fixing on the Sedge, which cannot fail of being a certain Direction in taking your Level, and you must by no Means quit the Sedge by deviating on one side or other, but tracing it according to it's Course, I think you cannot fail of soon finding a Descent.

Having found a proper Fall, the next Thing to be considered is the necessary Breadth and Depth the Drains are to be cut, but before that is treated of it will be proper to determine whether Bogs are Level or not, because a general Opinion prevails that they rise towards the Middle, and indeed where an Ascent is visible to the naked Eye, it must be very considerable in a Bog of a large Extent, one may suppose 20 Feet at least, now as the
Drains

Drains must be opened and cut on a Level from one End of the Bog to the other, the Turf of the Bog must be cut 20 Feet deeper in the Middle than in the Extremities, and the making your Drains so deep would not only be too Expensive, but also endanger their closing again, as the great Weight of Matter that must necessarily be thrown out of the Drains, would press in the Sides ; but the following Reasons will I hope be sufficient to prove that all Bogs are on a Level, and have no real Rise of any Consequence more in one Part than another. It will be readily granted that the Bog Water cannot be otherwise than on a Level, and why the Surface of the Turf should any where rise 20 Feet higher than it, to me is inconceivable ; therefore if Bogs appear to rise towards the Middle of them, it must be a *Deceptio visus*, in the same Manner as the Sea appears to one standing on the Shore, to rise considerably towards the Horizon ; so to one standing in a level open Country, the Land may seem to rise where the View terminates, though in Reality it does not. But to make it still more evident, let any one take Notice of a Bog at the Time of it's beginning to overflow, and I believe he will find the Surface in the Middle will be covered with Water as soon as the Surface in any other Part of it, besides, in making Roads through Bogs where they are obliged to cut
Trenches

Trenches on each Side thereof, the Water lies in the Trenches at an equal Distance from the Surface of the Turf from one End to the other, which it could not do if the Face of the Bog was not on a Level; this being allow'd,

The Drains must be cut so broad, as easily to drain off the superfluous Waters of the Bog into the Rivulet contiguous thereto, and so deep, as to leave a Soil fit for the Uses of Agriculture, without being liable to be overflowed even at the time of the greatest Floods: In order to form a Judgment, what Quantity of Water is necessary to be discharged through the Drains, I shall suppose the Bog to be drained, is at the Head of the River *Boyne*, and extends four Miles, it must be enquired how many cubic Feet of Water the main Drain must contain to discharge the Waters that may probably be supposed to fall or flow into such a Space: In order to this, I compute how many Foot of Water there is at *Oldbridge* (being near the End of it's Course) where the River is 120 Feet in Breadth, and find that the Quantity of Water flowing there at the Time of Floods, does not exceed 480 cubic Feet, by the serpentine Course the River takes, it runs about 70 Miles, consequently it receives near 27 Feet of Water every 4 Miles, upon a Supposition, that 4 Miles at

B

the

the Head yields a proportionate Quantity of Water to 4 Miles towards the End of its Course, which it cannot do, because in Summer there is little, and generally no Appearance of Water running towards it's Head, when at the same Time there are from 30 to 50 Feet running towards it's End, and may be thus accounted for. The Rains that fall on the interior Parts of an Island, and which are immediately conveyed into Rivers, soak into the Earth, where finding a subterraneous Passage tending on a Declivity towards the Sea, the Waters thereof may not be received into Rivers till they have approached near the Sea; consequently, the Quantity of Water that flows into that Part of a River that is within a Mile of the Sea, is far greater in Proportion than the Quantity of Water that can be received into it, within the same Space in any other Part of it. In Regard to the Head of a River where a Bog joins it, there seldom appears any Quantity of Water in it, except at the Time of the Bogs overflowing; for as the Waters of a Bog are pent up, and dam'd in, they are thereby prevented from constantly supplying the Channel of the River, by retaining the Springs that would otherwise flow into it, and are diverted another Way, that is, by a subterraneous Discharge; for in a great Extent of Soil it may reasonably be supposed, there are many Parts
of

of it gravelly, or at least of such a Texture, as to admit of a subterraneous Discharge of it's Waters, and the Efflux this Way is not only often equal to, but exceeds the Influx, as appears by the Waters of some Bogs subsiding in Summer Time a very great Depth below the Surface of the Turf, even so as to leave them quite dry, nay, even in Winter this subterraneous Discharge is generally sufficient to prevent Bogs from overflowing except in extream wet Weather, particularly when great Floods happen: What therefore is principally to be guarded against, and considered in Regard to the Breadth the Drains are to be cut, is the Height of Water that is above the Surface of the Turf of the Bog at the Time of these occasional Floods, and supposing that all the Waters that can at such Time fall on a Bog, and run into it from the adjacent Parts, would, if collected into one Channel, really take up the Space of 27 cubic Feet; it will not hence follow, that the main Drain (if made wide and deep enough) could suddenly receive such a Quantity even at the Time of Floods; because the Waters falling on, and soaking gradually into a turfy Soil of so great a Space as 4 Miles, would not precipitate into the Drains with that Violence they do into a River, but diffusing themselves through the Turf of the Bog, would

gradually run off through the Drains, and be several Days in discharging. Whereas the Waters that fall from Lands lying on a Declivity (as most do near Rivers) flow into the Rivers with Rapidity, suddenly swell them, and disappear in a Day or two ; but if those Waters which fall into the narrow Bounds of a River, were to be diffused over a Plain of four Miles Extent, they would be so shallow, that I am fully persuaded (when the Waters of a Bog have subsided in Summer to the Depth of four Feet, and Drains cut that Depth) the Floods of the succeeding Winter would not at any Time cause the Waters to rise in those Drains above eight or ten Inches at most, that is, a Discharge of about five cubic Feet of Water will prevent the Bog from overflowing at any Time. By the Observation Mr. *Derham*, and others have made, in Regard to the Depth of Rain falling in five different Climates, it appears that in the wettest of those Climates, it did not in any one Week exceed three Inches ; now, allowing a Bog may receive into it five Times more Water from the adjacent Parts than falls on it perpendicularly, it would rise only eighteen Inches in a whole Week, if there was no Discharge of the Waters at all within that Time ; how much less Depth of Water then, must there be in the Drains, when

when it is continually discharging itself as it flows into them, as well as what subsides into the Earth by Means of a subterraneous Passage? From these Reasons, I cannot help concluding, that a main Drain capable of discharging about five square Feet of Water, is sufficient to prevent the Overflowing of a Bog even at the Time of the greatest Floods. Though I have supposed the main Drain being cut six Feet broad, and discharging about five cubic Feet of Water will be sufficient to drain a Bog of only four Miles Extent, yet it probably may be sufficient for a Bog of a much greater Extent, because the greater the Extent a Bog is, the greater is the subterraneous Discharge; besides, Bogs of a very large Extent, have often two Outlets for discharging their Waters if our Maps may be depended on, where it seems the Waters of the Bog between *Clonbullock* and *Portarlington*, are on the South discharged by the River *Barrow*, and those on the North by the River *Boyne*.

The Breadth of the main Drain being determined, I shall next consider how deep the Drains must be cut, so as to leave a Soil fit for the Uses of Agriculture, and not liable to be overflowed. To cut them four Feet deep, will I think answer that Purpose; for when

the Waters of the Bog are drained to that Depth, the Turf of the Bog will subside about $1\frac{1}{4}$ Foot more or less, according to the firm or loose Texture thereof, and leave a Soil above the Level of the Bog-water about $1\frac{3}{4}$ Foot in Time of Floods, $2\frac{1}{4}$ Feet in wet Weather, and about 4 Feet in dry Summer Weather; that is, the Water will subside about $1\frac{1}{2}$ Foot below the Bottom of the Drains, even in wet Bogs; it is well known there are two Sorts of Bogs, the one wet even in Summer, the other dry, but even those called wet Bogs, are generally dry about $1\frac{1}{2}$ Foot below the Surface of the Turf in the Summer, therefore if the Waters of a wet Bog subside about $1\frac{1}{2}$ Foot from the Surface now, when trenched and drained off, they will subside the same Depth below the Bottom of the Drains, and consequently leave a Soil of about four Feet in Summer, which will be fully sufficient to answer all the Ends of Agriculture, except the planting Forrest Trees, and the Soil will be firm enough to bear Carriages on it, for it is easy to conceive what Firmness even a turfy Soil of four Feet will acquire, when sunk and contracted into $2\frac{1}{2}$ Feet, and what a great Weight it will bear, when it is supported by, and rests on so firm a Body as Turf and Water.

Dr.

Dr. Plot, in his History of *Oxfordshire*, gives an Instance of an Husbandman that drained a Bog effectually, by cutting the Drains only three Feet deep, and though by the subsiding of the Turf, they were reduced to the Depth of about 1 Foot or 1 Foot $\frac{1}{2}$, yet the Soil was so firm, he says, as to bear *English* Carriages on it, of which I make not the least Doubt.

If cutting the Drains only four Feet, should be found upon Tryal not to be sufficient, cut them five Feet deep.

As the Success of the Undertaking depends on your having found a proper Fall, be very certain of it before you are at the Expence of opening the Drains.

The Drains must be laid out according to the differing Circumstances of Bogs. Some Springs are continually running, and discharging near as great a Quantity of Water in Summer as in Winter, while others quite disappear in Summer, or at least discharge very little in Comparison to what they do in Winter: Those that continually flow into a Bog, must always keep it more or less full of Water, and constitute what we call a wet Bog, those that have little or no Springs running into them, and are only occa-

sionally supplied with Water from the Uplands, are called dry Bogs.

The wet Bog shews a Channel of pure Water, where the Land Floods, as well as Springs, originally centered and discharged themselves, before the Valley became a Bog, the Passage whereof being obstructed (as I have before observed) the Channel became thereby broader; hence it necessarily follows, that as the Valley had originally a Discharge for the Waters that flowed into it, so it now has a superficial Discharge, when the Waters rise above the Level of the Turf; therefore the opening a Drain, and running it from the Fall into this Channel, must cause a Discharge of the Waters as formerly, at least to such a Depth as the Drain is cut: However, it may be difficult to suppose, that a single Drain cut only five Feet deep, and six Feet broad can be sufficient to drain off the Waters that fall from the Uplands into this Channel, especially where the Bog is of so large an Extent, that the Space between the Borders of the Bog and the Drain, may sometimes be two or three Miles; whereby the Waters having so great a Space to pervade, would make so slow a Progress through the Turf as to cause an Overflowing, before it could reach to, and discharge itself into the Drain: But as these Waters did originally

originally pervade that Space through the Grass into the Channel, and very probably without overflowing it, I cannot see any Reason why it may not do the same now through the Turf; for tho' I do allow that Turf is a Substance somewhat more compact, and cannot suffer the Water falling on it to pervade it quite so fast as through growing Grass, yet the Difference is so trifling as scarce to admit of Altercation about it; for whoever considers the porous Nature of Turf must allow that Water pervades it with some Celerity, when there is a Passage made for its Discharge, as is well known by cutting Turf below the Bog Water, where one no sooner makes a Cut and throws out the Sod, but the Vacuity made thereby fills instantly with Water: Indeed where the Fall of Water from the Uplands into the Bog is very unequal, so that in some Parts the Waters are collected into a great Body and fall like a Torrent from some Gap or Aperture of the Uplands into the Bog, I will allow it may be necessary to open a secondary Drain to receive such collected Waters, and convey them into the main Drain more immediately than they can be supposed to pervade the Turf.

In a dry Bog there is no such Channel of pure Water, and this is owing to its not being supplied with Water by Springs as the other is,
therefore

therefore it must receive its Supply of Water from some other Source, and this must be from a more than ordinary Fall of Water from the Uplands, for it seems this as well as a wet Bog is subject to occasional Overflowings, and these Land Floods are very probably more violent than in a wet Bog; as the Uplands are usually found to lie higher and to extend farther, consequently more Water flows from them in wet Weather than from the Uplands of wet Bogs, which do not rise so high, and are not so extensive; and as the higher and more extensive the Uplands of a dry Bog are, the more Gaps or Apertures there probably are in them that collect and emit larger Quantities of Water: in order therefore to drain off these Land Floods more effectually, it may be necessary not only to open the main Drain wider in a dry Bog, but also to cut secondary Drains from each Gap or Aperture that emits large Quantities of Water, in order to receive and convey them into the main Drain, which must be opened quite through the Bog. Four or five of such secondary Drains, according to the Extent of the Bog, may be sufficient to convey the principal Part of these Waters immediately into the main Drain, while the lesser Falls of Water may be left to diffuse themselves through the Turf without any Danger of overflowing it. So few Drains being allowed to be sufficient, it will occur to every one how inconsiderable the Expence

pence of draining even a Bog of the greatest Extent will be, whether it be a wet or a dry one : And it is hoped this Consideration will induce those Gentlemen who have Estates bordering on Bogs to make an Attempt to drain them, as the Experiment at least will cost very little ; for in a wet Bog there will be no Occasion to open the main Drain above eight or ten Inches below the Surface of the Bog Water, nor broader than three Feet, which being done, take Notice how much the Water subsides in such a Space of Time, and you will be able to judge whether it will be advisable to open it the full Breadth and Depth ; and in regard to a dry Bog, you may try whether the opening one main Drain quite through it, the full Depth, and Breadth, may not answer the End without opening any secondary Drains, tho' not so immediately ; for allowing the Bog Water to have subsided a considerable Depth, the next Land Floods falling on different Parts of the Turf of the Bog would be soon soaked up as into a Sponge, all the Time spreading through the Turf, and making their Progress towards the main Drain, where as fast as they flow in, are discharged ; and granting that by this Means five or six cubic Feet of Water is continually discharging itself, it must be allowed that such a Quantity of Water, joined with what the Turf would contain within itself, might very probably prevent an overflowing, or if it should happen to overflow, it must
soon

soon subside and be discharged by Means of this single Drain.

The Method of cutting through Turf is so well known, that it is needless to say any thing on that Head, but the opening a Passage through Sedge being seldom or perhaps never practised, it may not be thought impertinent to make some Observations thereon, as the Method of Operation must be quite different. Sedge being compos'd of shorn Herbage, whose Ramifications are matted and interwoven by the Agitation of the Waters, and these again strengthened by a plexus of the strong Fibres of the Roots of Weeds growing thereon, form a very tough Substance, elastick, and resisting the Force of the Spade like a Bundle of Hemp or Flax: Therefore instead of cutting through this sedgy Substance as you do Turf, it must be torn up by proper Instruments, as Prongs with the Points bent inwards, and where its Stubbornness will not suffer it to be separated in that Manner, it must be cut horizontally with an Instrument like a Mattock, but with an Edge of the Length of an Hay Knife, the Prongs at the same Time keeping it on the stretch till the Mattock has freed it; you will find this Substance will reach from where you open the Drain at the Fall, till you
come

come to the Level or Turf of the Bog: Having before observ'd that this Sedge is composed of such shorn Herbage as is not liable to putrify, by always retaining as much Moisture as will preserve it from the Effects of a drying Air or too much Heat; tho' this holds good in regard to a wet Bog, yet I very much doubt whether it will in regard to a dry one; for as the latter often continues a long Time without filling, the Air and Heat in the mean Time would not only absorb all its Humidity on the Surface, but before it could receive a sufficient Supply of Moisture, the shorn Herbage would rot, moulder into Dust and thence become Soil, and probably form a stiff earthy kind of Turf: but whatever Substance it becomes, you may rest satisfied it is different from the generality of the Turf of the Bog, and that will be Indication enough to show that wherever you find it to extend a great Length and Breadth it leads to a Fall. In regard to the Trouble and Tedioufness of cutting through the tough Sedge of a wet Bog, it may be advisable to avoid it entirely and open the main Drain through the Land contiguous to it, if the Quality of the Soil and Situation of such Land will admit of it; this every ones Discretion will direct him in.

As

As Accident first caused these vast Tracts of Land to become unprofitable, so Negligence has suffered them to spread and make daily Encroachments, which are the more dangerous as they gain Ground unperceived, and by such slow and insensible Degrees that the Loss is not immediately felt, but in a great Length of Time the growing Evil cannot fail of affecting the Publick in a very high Degree: To show the ill Consequences of not putting a Stop to such Encroachments, it may be remarked, that if the Stoppage at the Dam should cause a Bog to encrease and rise every Year half an Inch, this, tho' seemingly inconsiderable, may be a Means of overspreading very great Tracts of Land much sooner than is imagined, for when by its continuing annually to rise, the Bog Water has gained the Summit of a rising Ground, it thence flows into the low Grounds or spreads itself into the adjacent Flat, making them first Marshes, then Bogs, and thus, proceeding from one Place to another, lays waste wherever it spreads, continuing and enlarging its Devastation in proportion as the Water thereof rises, and the Situation of the neighbouring Lands admit.

As

As the draining these vast Reservoirs of Water must necessarily be a Means of regaining the Land they have laid waste, and as the Enlargement of Tillage or Agriculture of any Kind is of the greatest Importance, every Attempt to answer that End will, 'tis hoped, be favourably received by the Public.

F I N I S.

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As the draining of the vast Reservoirs of Water
must necessarily be a Means of regaining the
land they have laid waste, and as the Enlarge-
ment of the River for Agriculture of any kind is of
the greatest importance, every Attempt to answer
that End will be highly & favourably received
by the Public.

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